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AUTHOR Hill, Pamela
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ABSTRACT

This student manual, part of a small-engine repair series on servicing fuel systems, is designed for use by special needs students in Texas. The manual explains in pictures and short sentences, written on a low reading level, the job of replacing carburetor diaphragms. Along with the steps of this repair job, specific safety and caution information is frequently noted. To reinforce consistency in material presented to the slow learners, the pictures and written words correspond exactly with the pictures and wording on a corresponding audiovisual presentation. A progress chart for rating the students is included in the manual. (KC)

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STUDENT MANUAL 2

FUEL SYSTEM
SMALL ENGINE REPAIR SERIES

REPLACE THE CARBURETOR DIAPHRAGM

PULSA-JET STYLE WITH AUTOMATIC CHOKE

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Bob Norsworthy
ART DIRECTOR

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WHAT YOU WILL FIND IN THIS BOOKLET

The point of this booklet ..... Page 1

Tools and equipment for replace the carburetor diaphragm ..... Page 2

Steps for replace the carburetor diaphragm ..... Page 4

Can you replace the carburetor diaphragm? ..... Page 30

CHOKE
CHOKE

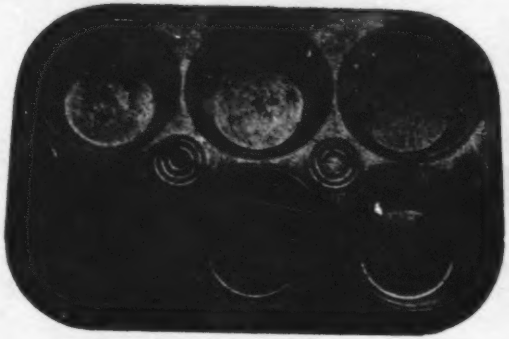
THE POINT OF THIS BOOKLET

As a small engine mechanic, you may have to replace the carburetor diaphragm on a small gas engine. This booklet will help you learn what tools and equipment to use and all the steps of this job.

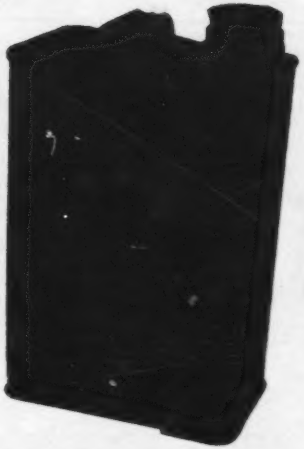
As you practice these steps on a real engine, you and your teacher can rate your progress on a chart on pages 30-32. Don't forget to follow the safety and good work habits that you have learned.

TOOLS AND EQUIPMENT:

carburetor cleaner



parts container

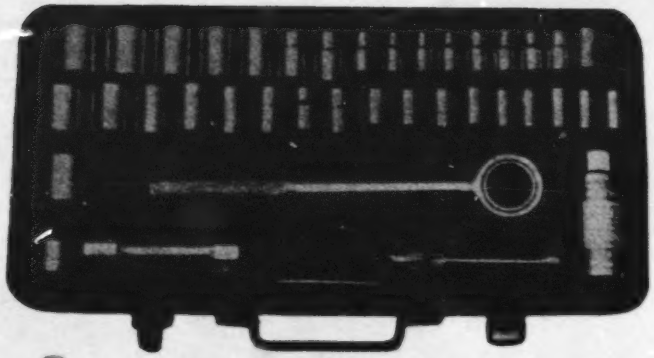


gasoline

new "O" ring

Phillips screwdriver

7

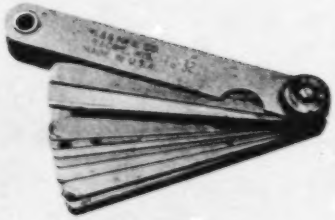


socket set

flat-tip screwdriver

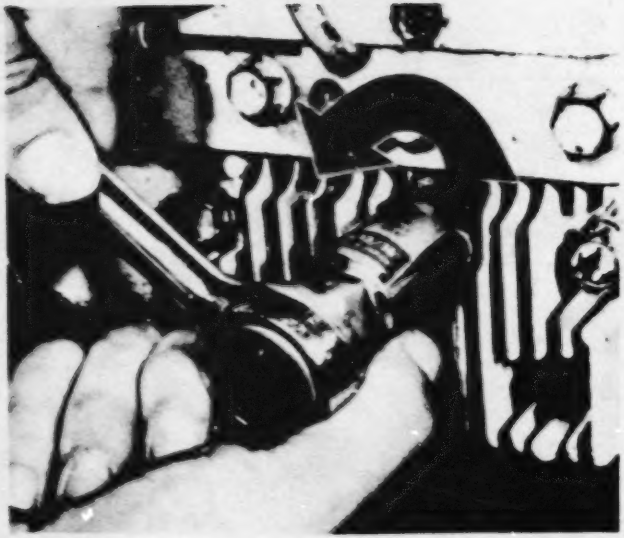
straightedge

new diaphragm



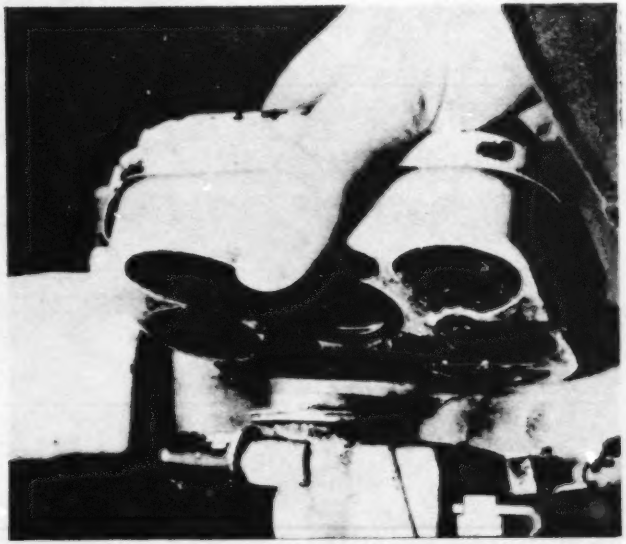
feeler gauge

shop towel



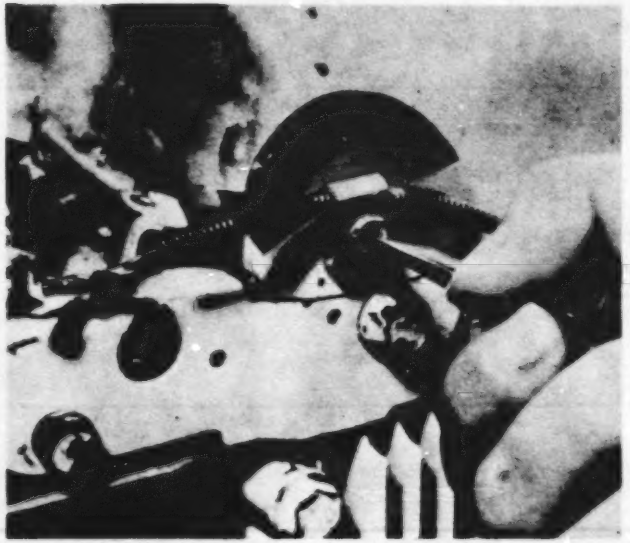
1. Remove the spark plug wire and spark plug from the engine.

   Caution: Use a spark plug socket to remove the spark plug and not some other tool that might damage the plug.

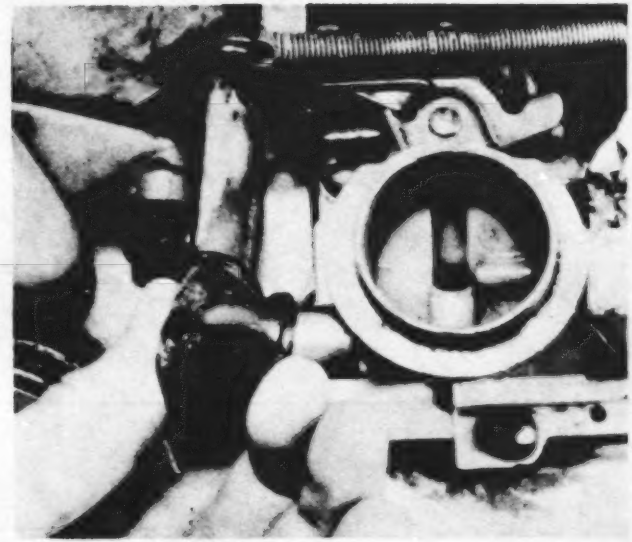


2. Using a flat-tip screwdriver, remove the mounting bolt and air cleaner from the carburetor. Set the bolt and air cleaner aside.

9

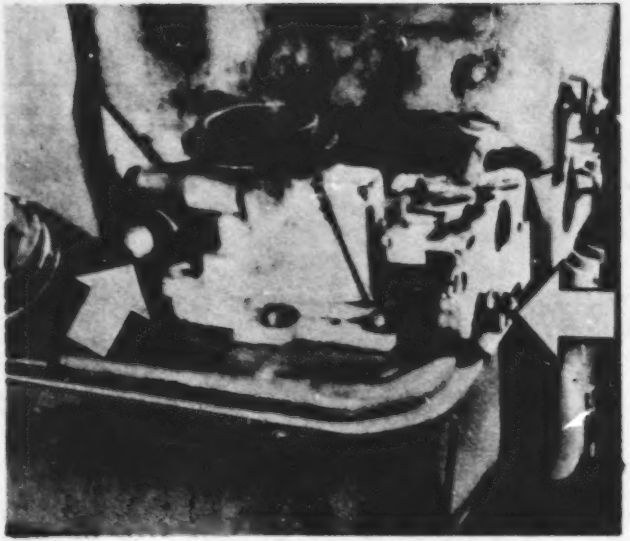


3. Loosen the throttle cable clamp bolt. Remove the cable from the throttle.



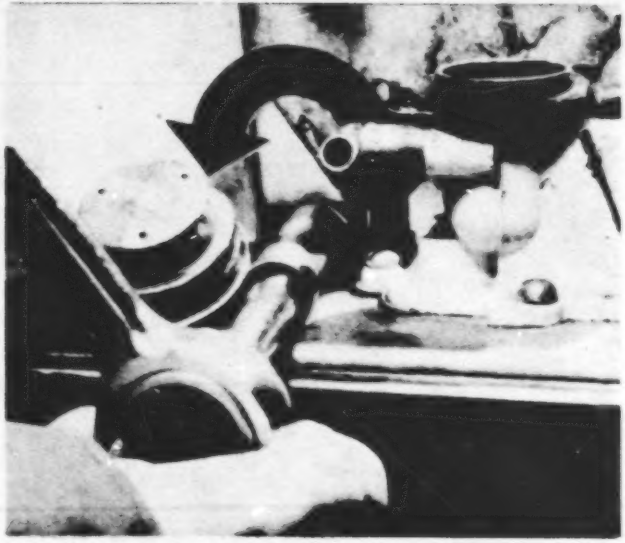
4. Carefully pull off the breather hose that is connected to the carburetor tube and crankcase breather tube. Set it aside.

Caution: Be careful not to tear the hose.

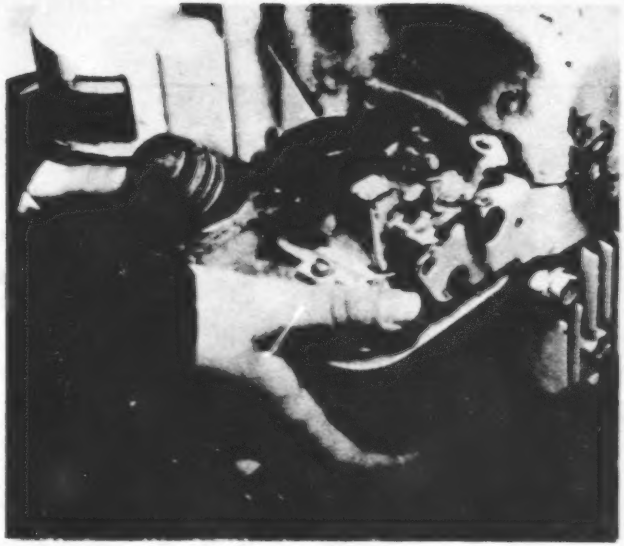


Note: There are 2 mounting bolts which hold the carburetor and fuel tank to the engine. The bolts are 2 different sizes.

5. To remove the smaller bolt, use a 7/16" socket and ratchet. Put the bolt and its washer in the parts container.

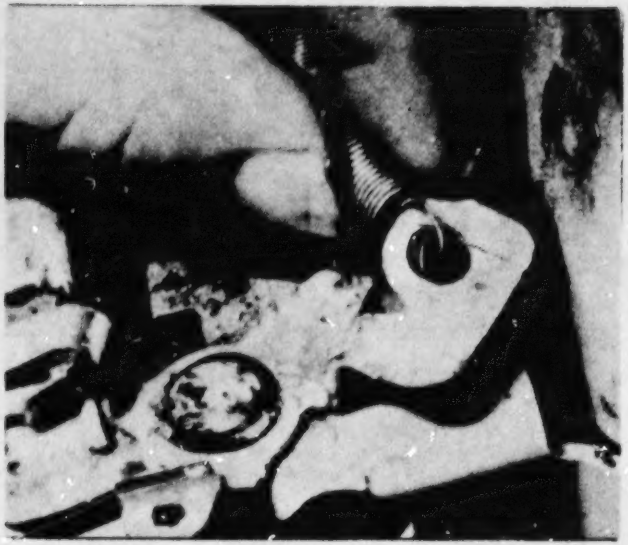


6. Use a 1/2" socket, extension, and ratchet to remove the larger bolt. Put this bolt and washer with the others in the parts container.



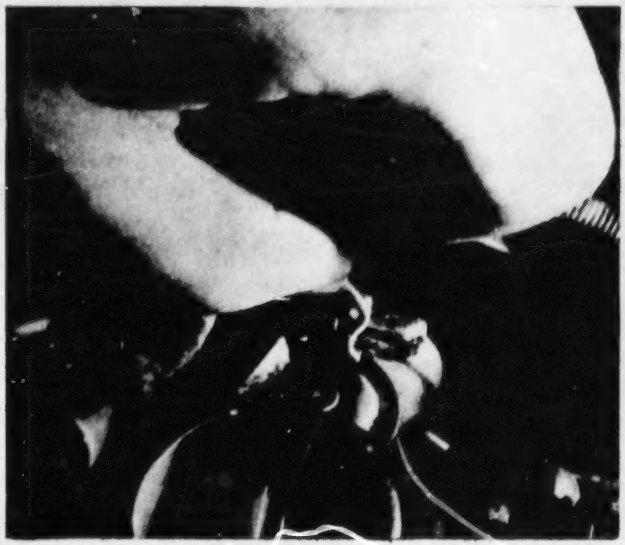
7. Carefully loosen the carburetor and fuel tank from the crankcase intake tube.

   Caution: Do not pull it off completely because the governor spring and link that are still connected to the throttle could be damaged.

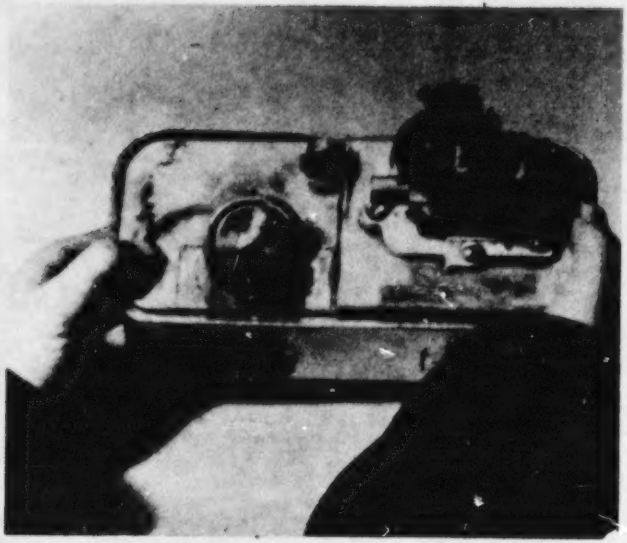


8. Unhook the governor spring from the throttle by carefully twisting the spring end loop out of the throttle hole.

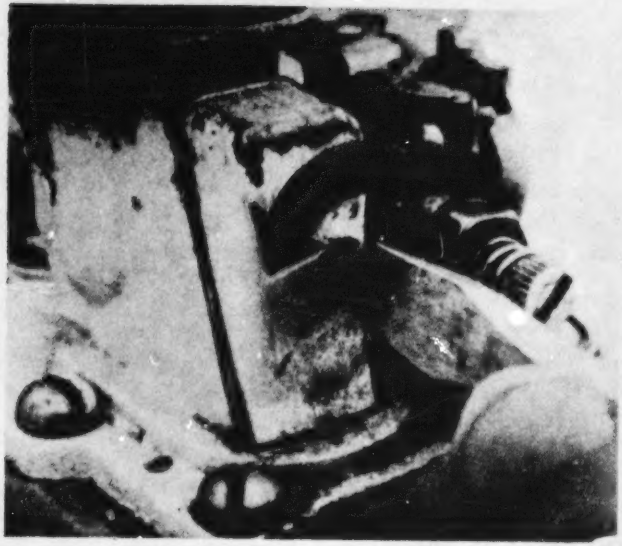
   Caution: Be careful not to bend the spring loop out of shape or stretch the spring.



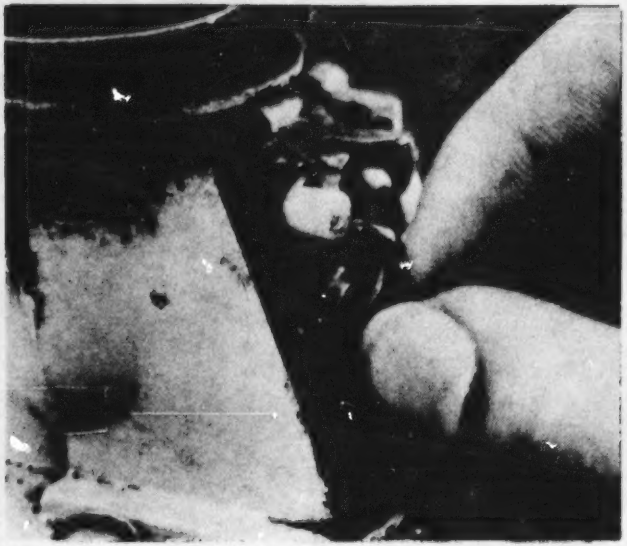
9. Unhook the governor link at the throttle. Do this by slightly tilting the carburetor and fuel tank toward the engine so the link will easily come out of the throttle hole.



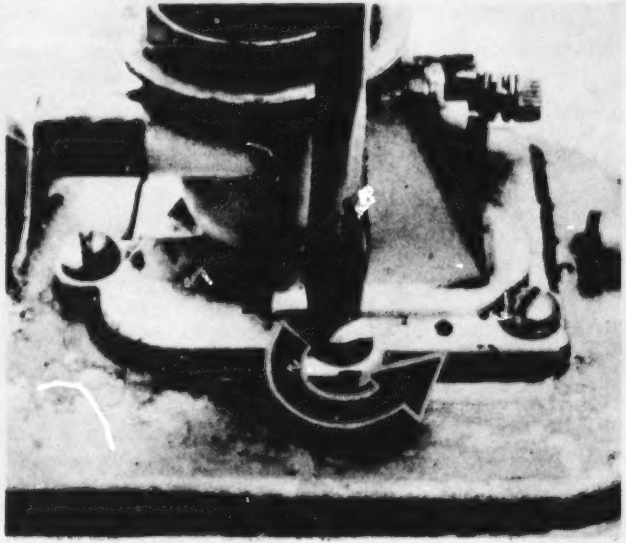
10. Remove the carburetor and fuel tank. Set them on your work bench.



11. Remove the automatic choke link cover and bolt using a flat-tip screwdriver. Set the cover, gasket, and bolt in the parts container.

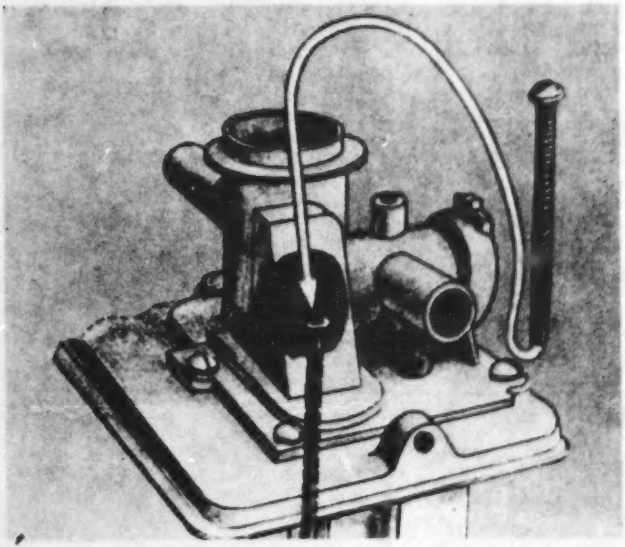


12. Carefully pull out the choke link from the choke shaft.



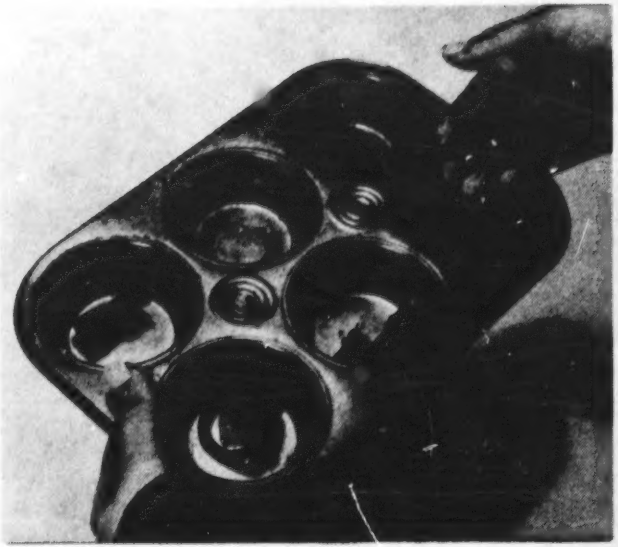
13. Using a flat-tip screwdriver, remove the mounting bolts which hold the carburetor onto the fuel tank.

Note: There may be as many as 5 or 6 mounting bolts.

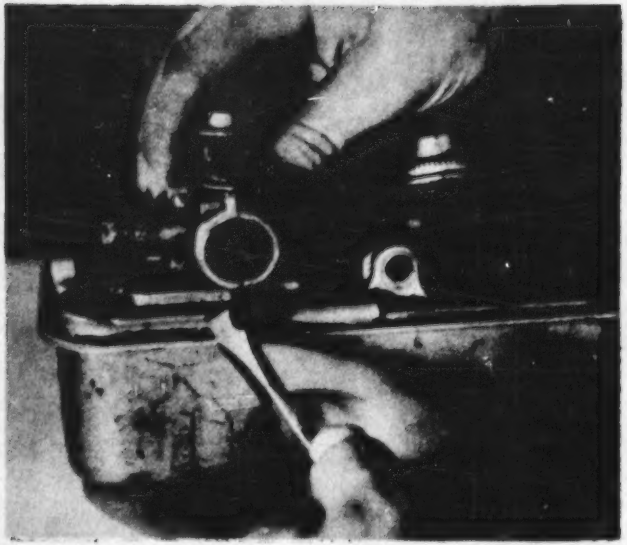


Note: On some types of carburetors, there will be a mounting bolt inside the carburetor and underneath the choke plate.

14. Use a Phillips screwdriver to remove this bolt.

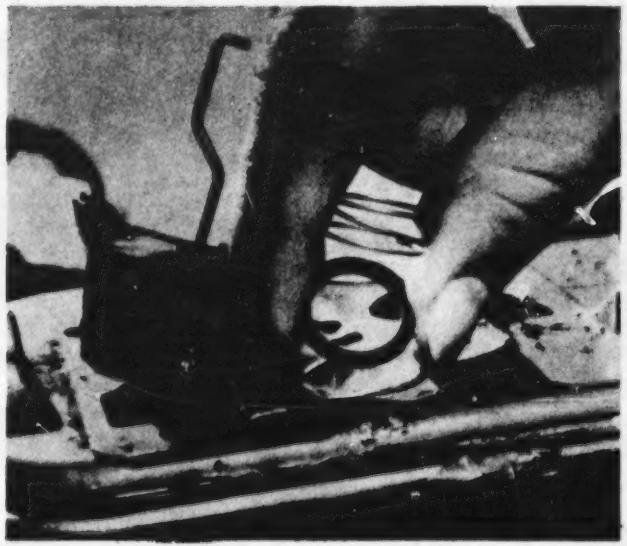


15. Place these bolts and washers together in the parts container.



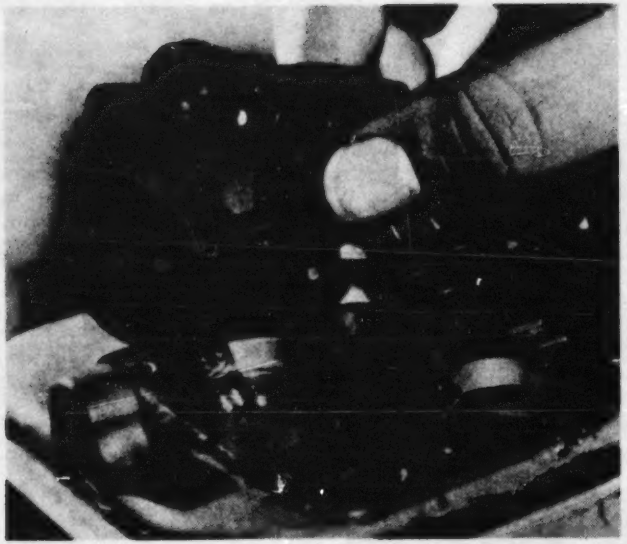
16. **Carefully separate the carburetor from the fuel tank using the flat-tip screwdriver.**

    Caution: Be careful not to damage the fuel pipes and choke link.

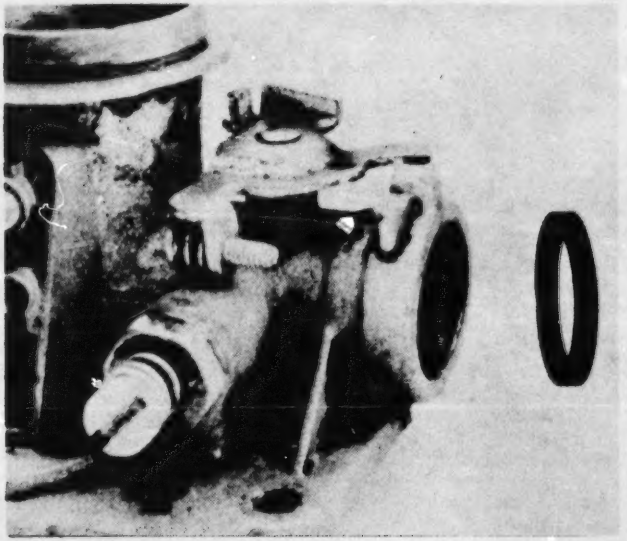


17. **Remove the fuel pump spring and cap between the carburetor and diaphragm. Place the spring and cap in the parts container.**

17



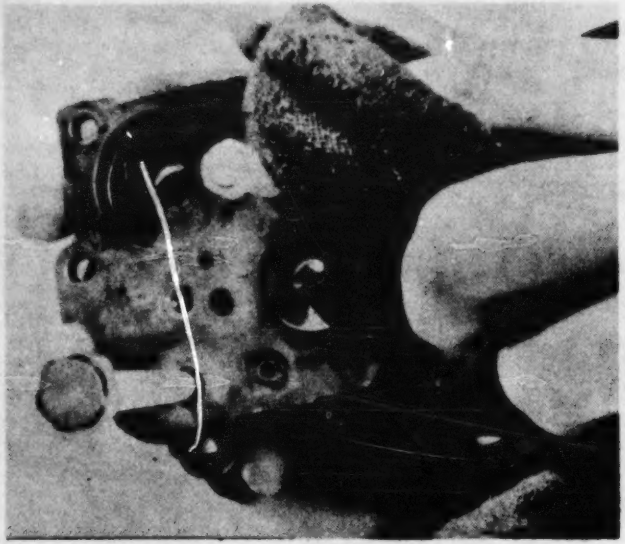
18. Remove the old diaphragm from the fuel tank. Put the old diaphragm in the trash.



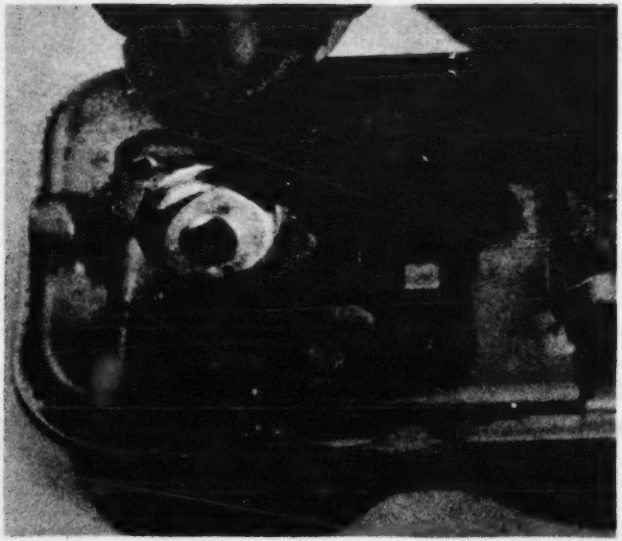
19. Check the "O" ring gasket on the carburetor to see if it is brittle, torn, or pulled out of shape.

    Note: If it is, then replace it with a new one.

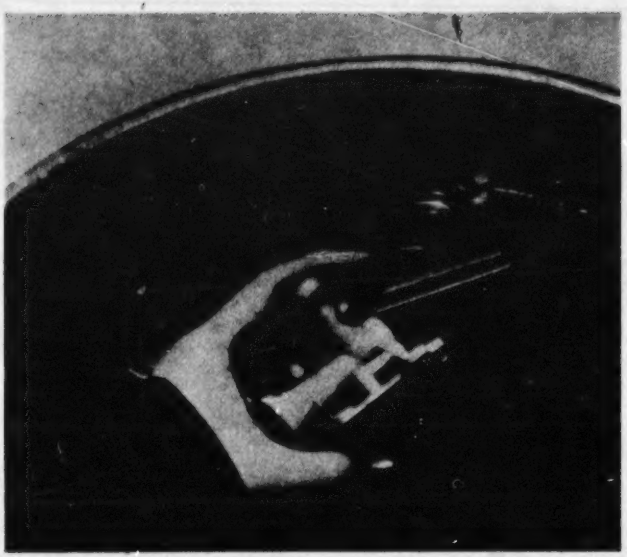
18



20. With a shop towel, wipe off any dirt and grease on the bottom of the carburetor.

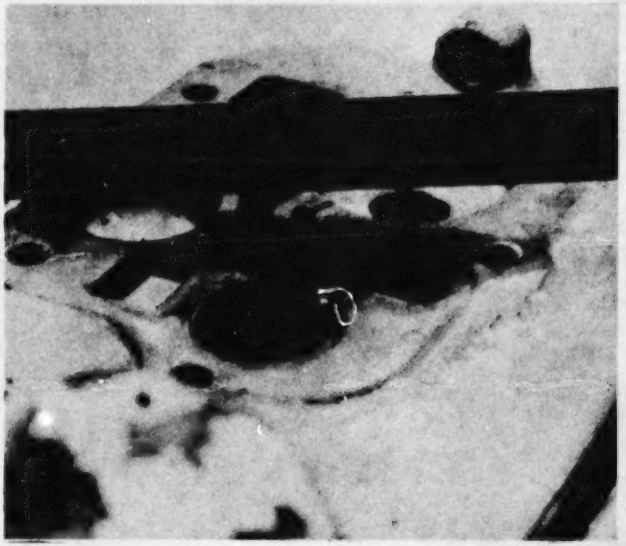


21. Wipe off any dirt on the top of the fuel tank.

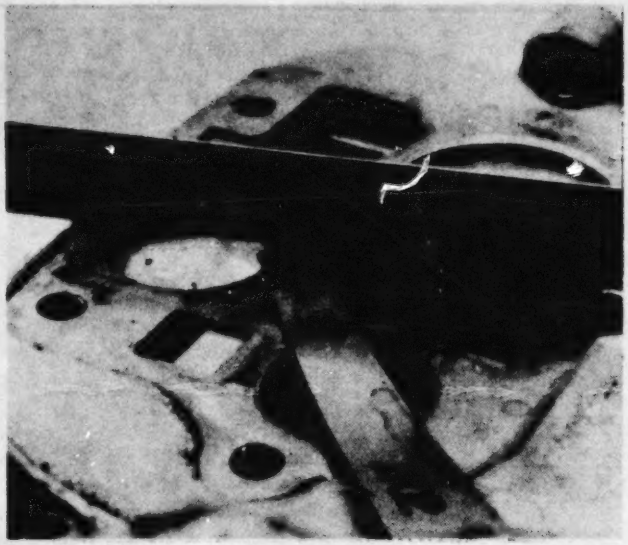


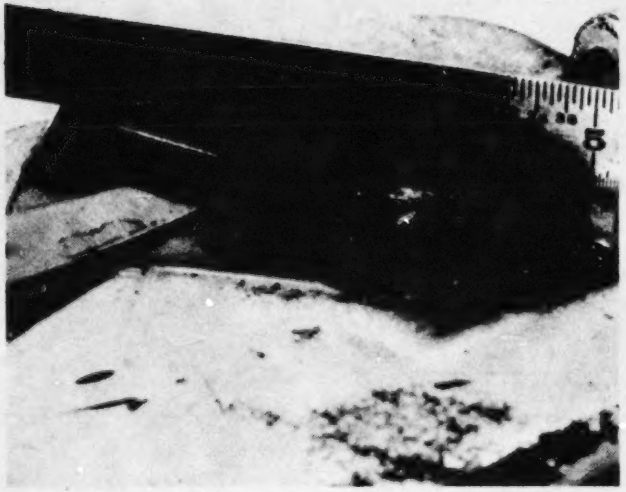
22. If the carburetor and fuel tank are very dirty, then soak them in carburetor cleaner.

    Caution: Before soaking these, remove all nylon and rubber parts such as the fuel pipes, "O" ring gasket, and choke shaft.



23. Check the fuel tank top for warpage. Hold a straightedge across the middle area on top of the tank.

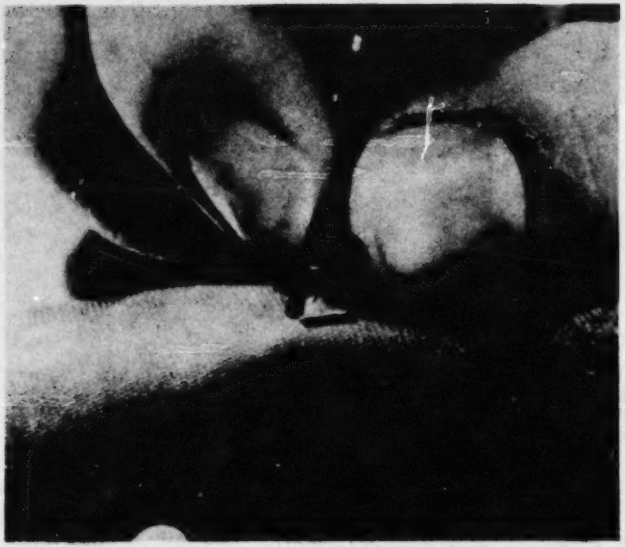




24. **Try to fit a .002" feeler gauge between the straight edge and the middle area of the fuel tank top.**

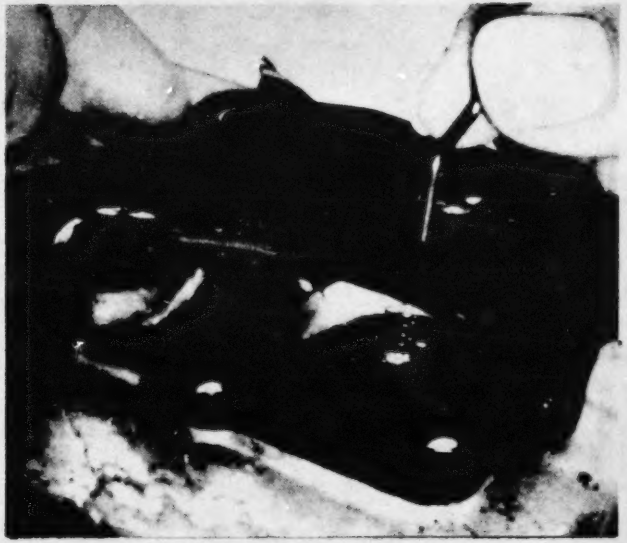
Note: If the tank top is flat, the gauge will *not* fit between the straightedge and fuel tank.

Note: if the tank top is warped, then the diaphragm will not give a tight seal and gasoline could enter the carburetor, causing engine problems. Always replace a warped fuel tank with a new one.



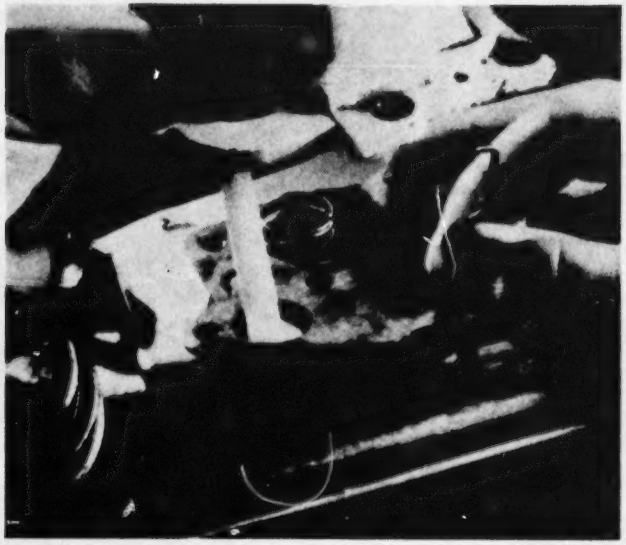
25. To put in a new diaphragm, place the automatic choke spring into the plastic lock on the bottom of the new diaphragm.

    Caution: Be careful not to bend or stretch the spring.

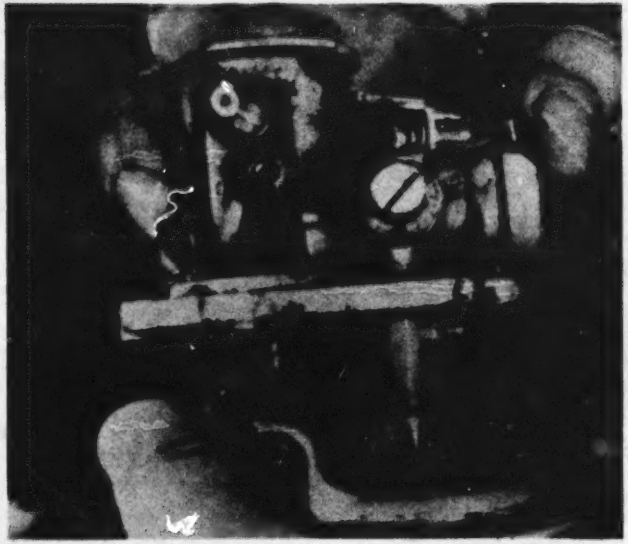


26. Carefully place the new diaphragm on the fuel tank. Match up the holes in the diaphragm with the openings on the fuel tank. Fit the choke spring into the fuel tank spring pocket.

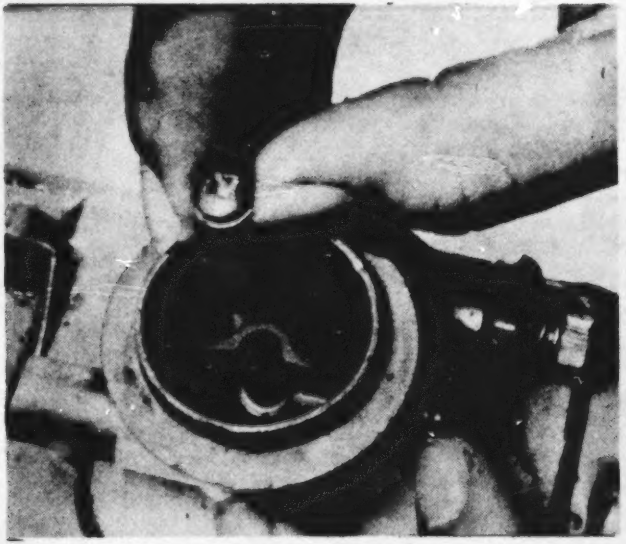
27. Place the fuel pump spring and cap over the round recess on top of the diaphragm.



28. While holding up the automatic choke link, carefully place the carburetor on top of the diaphragm.



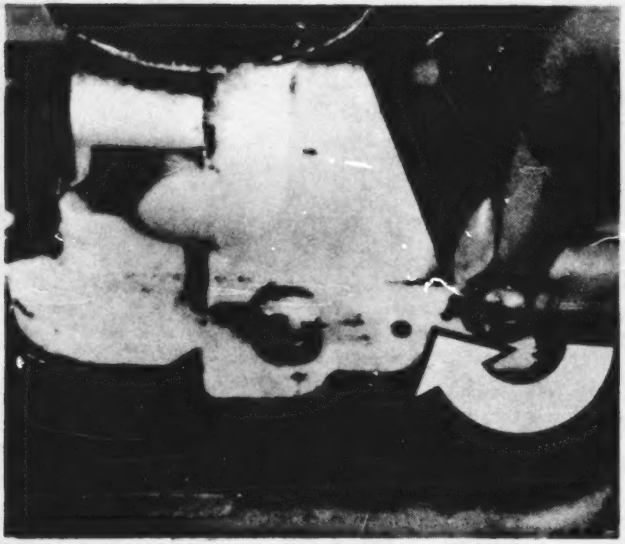
29. Fit the fuel pipes through the 2 holes on the diaphragm. Fit the choke link on the diaphragm through the link hole on the carburetor.



30. With the Phillips screwdriver, securely tighten the mounting bolt that goes inside the carburetor and under the choke plate.

Note: Your carburetor may not have this bolt.

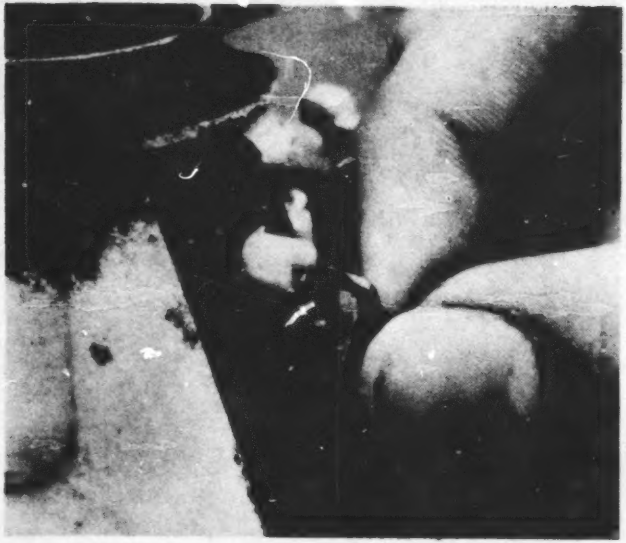
24



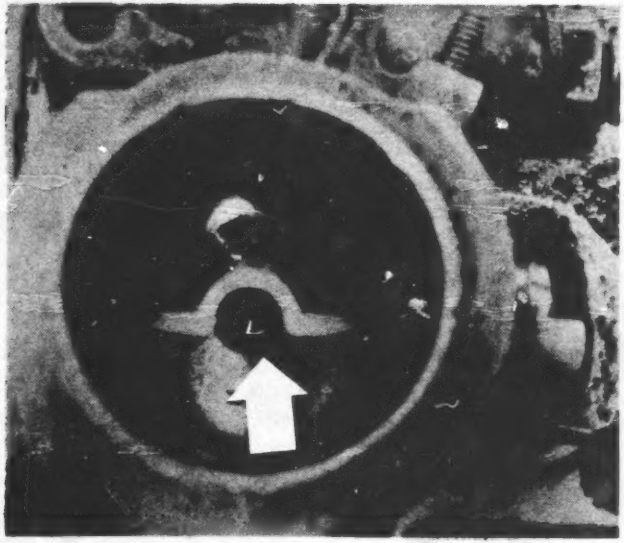
31. With your fingers, thread the other mounting bolts down 2 turns.

    Caution: Do not tighten the bolts until the automatic choke has been assembled because it could be damaged.

32. To assemble the automatic choke, hold the choke plate closed with your finger.

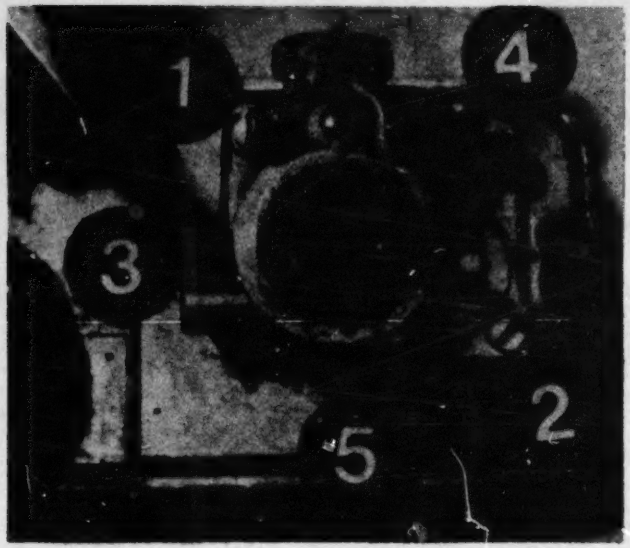


33. **While holding the plate closed, place the choke link into the choke shaft.**



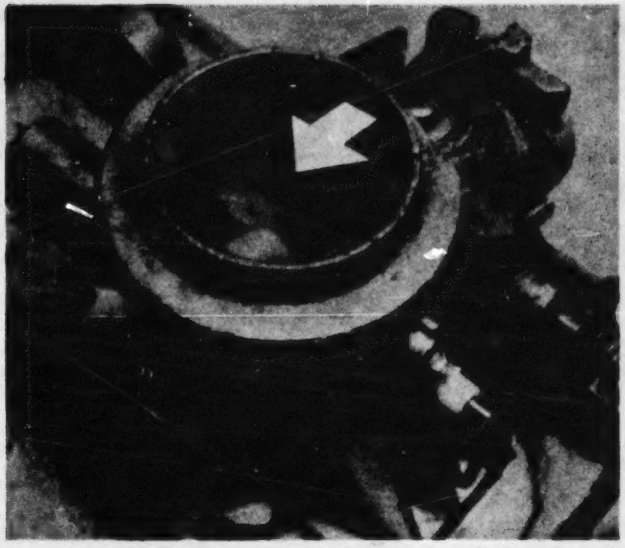
34. **Open the choke plate so that the mounting bolts can be tightened.**

Caution: Make sure the choke plate stays open while doing the next step or the choke could be damaged.



35. Alternately tighten the mounting bolts in a staggered sequence, as they are numbered in this picture.

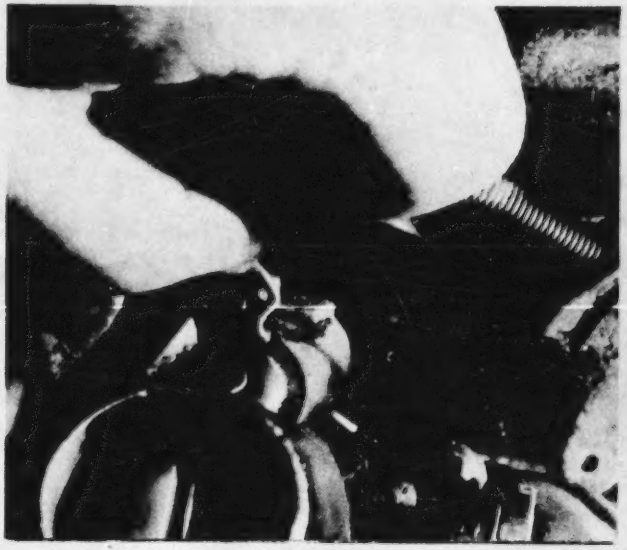
Caution: This will keep from bending the fuel tank or carburetor out of shape.



36. Move the choke plate to a normal position.

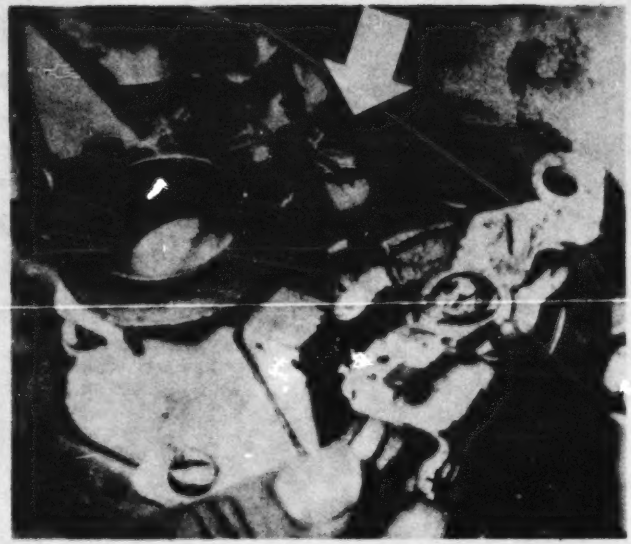
Note: The plate should now fully close. If it doesn't, then check the choke spring to see if it is on the diaphragm correctly.

37. Replace the automatic choke link gasket and cover. Tighten the cover bolt with the flat-tip screwdriver.



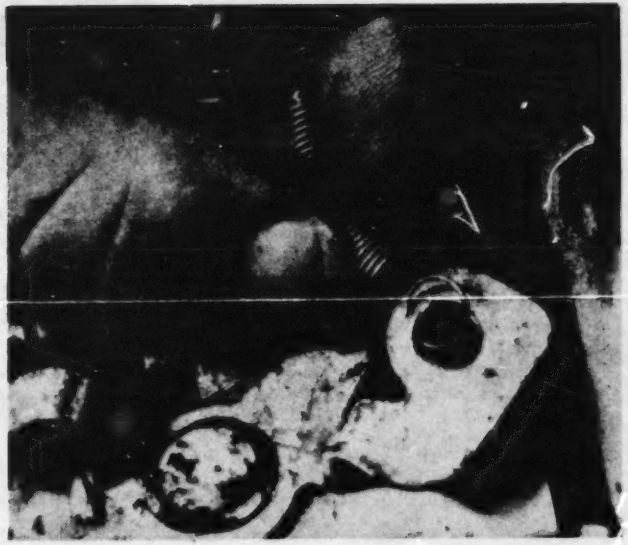
38. Hold the carburetor and fuel tank at an angle and close to the crankcase. Hook the governor link to the throttle.

Note: The governor link and spring should still be hooked to the governor blade.



39. Move the throttle to the left and fit the carburetor onto the crankcase intake tube.

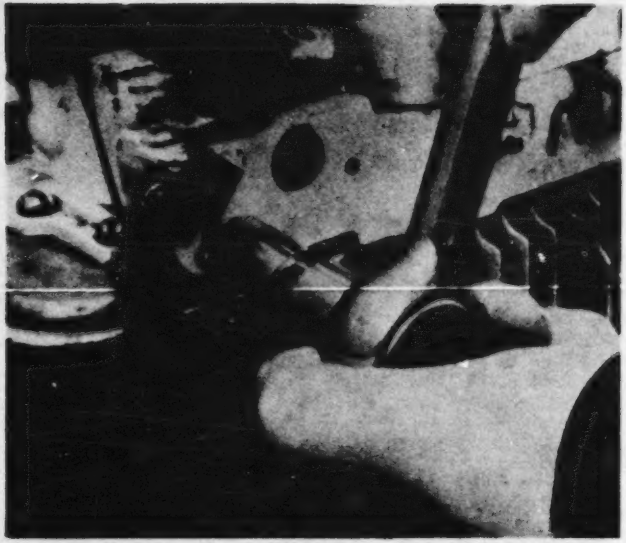
Caution: Be careful not to bend the "O" ring gasket in the carburetor.



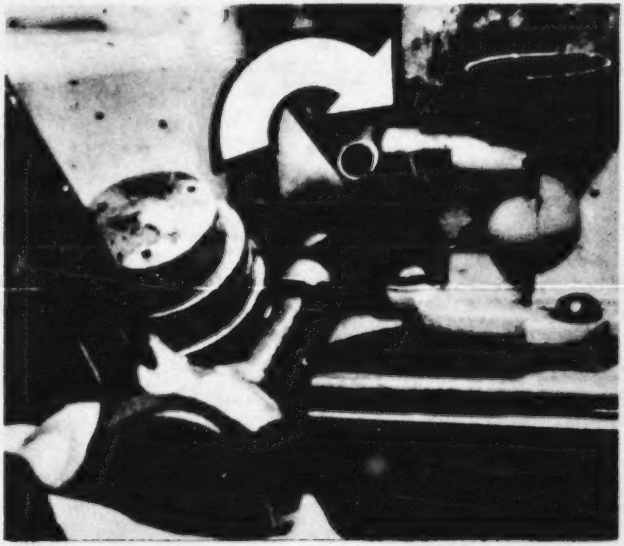
40. Carefully twist the governor spring onto the throttle.

Caution: Be careful not to stretch the spring or bend the loop end out of shape.

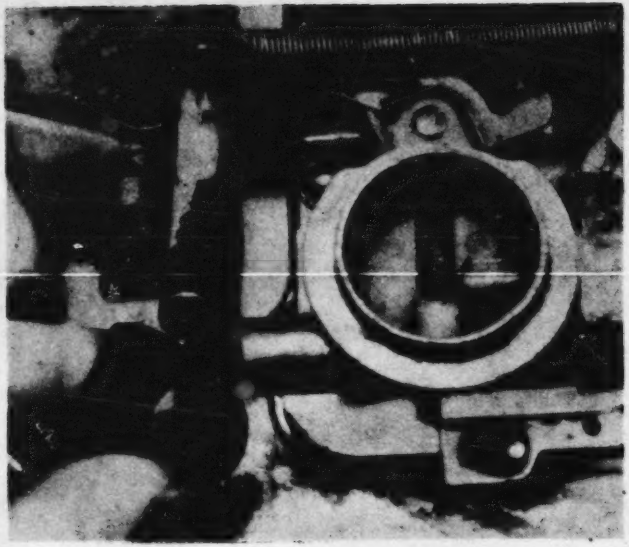
29



41. Replace the 2 mounting bolts which hold the carburetor and fuel tank to the engine. Use a 7/16" socket and ratchet for the smaller bolt.

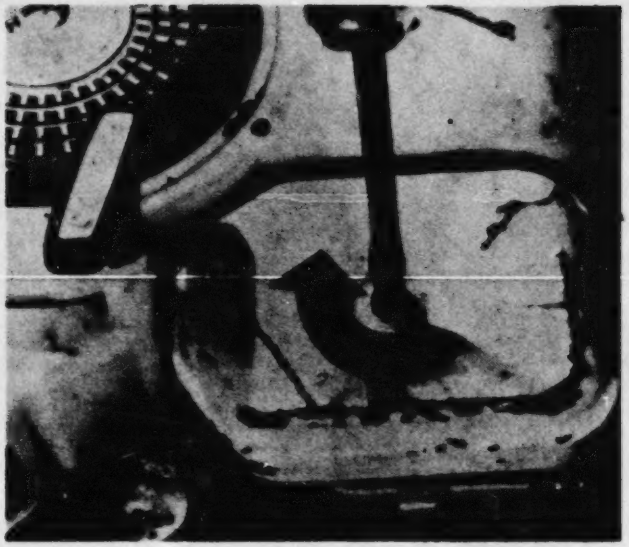


42. Use a 1/2" socket, extension, and ratchet for replacing the larger mounting bolt.



43. Pinch the 2 ends of the breather hose together and fit it onto the carburetor and breather tubes.

44. Hook the throttle cable onto the throttle. With a flat-tip screwdriver, tighten the throttle cable clamp and bolt.

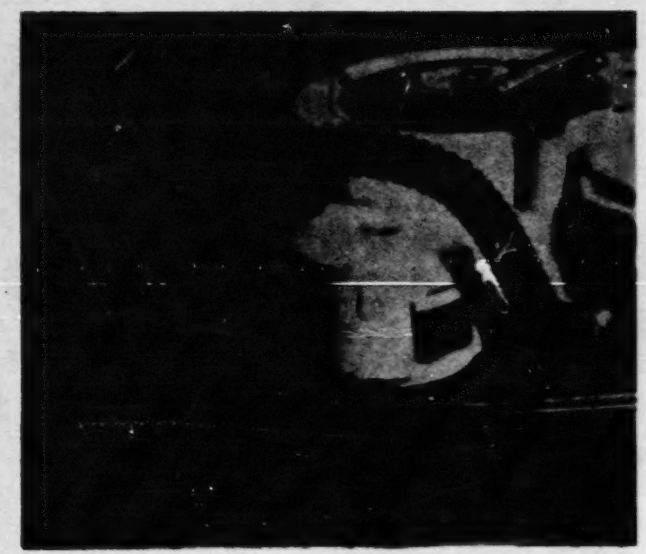


45. Replace the air cleaner and bolt on top of the carburetor.

46. Replace the spark plug and the spark plug wire.

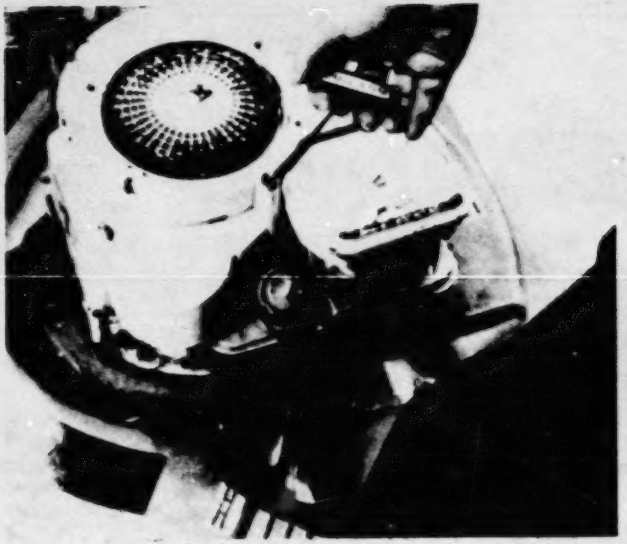
Caution: Remember to use the spark plug socket for tightening the spark plug.

32



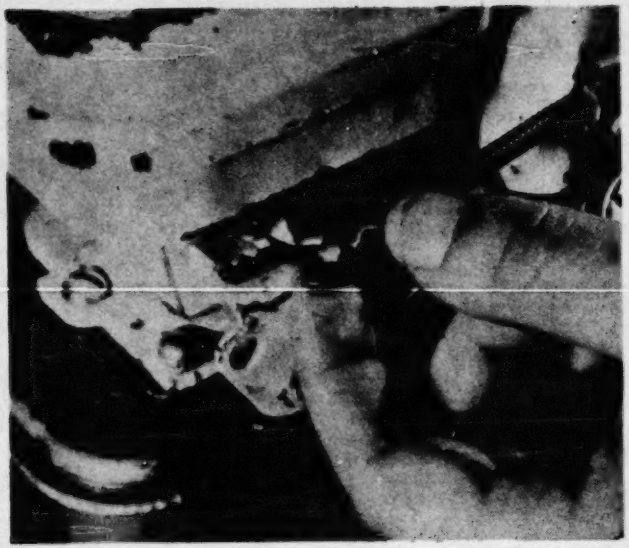
47. Fill the fuel tank 1/2 full with gasoline.

Safety Tip: Never fill the fuel tank while the engine is hot or running.



48. Crank the engine. Let it run for about 2 minutes to warm up.

Safety Tip: Make sure tools and feet are away from moving engine parts.



49. Adjust the carburetor or throttle so that the sound of the engine is normal.

50. Return the tools to the tool room and clean up the work area. You are now finished with this job.

CAN YOU REPLACE THE CARBURETOR DIAPHRAGM?

Each day practice doing this job and fill in the chart on the next pages. Use a rating number below that describes how well you can do the steps of the job. By the end of 10 days you will see your progress.

RATING	MEANING
1 =	Can do simple parts of the job, but still needs to be shown how to do most of it.
2 =	Can do most parts, but may need help on hard parts.
3 =	Can do all parts without help. Ready for job entry with shop supervision.

35

CHART FOR CAN YOU REPLACE THE CARBURETOR DIAPHRAGM?	DAYS									
	1	2	3	4	5	6	7	8	9	10
1. Assembles and uses tools correctly										
2. Removes spark plug, wire, air cleaner, throttle cable, and breather hose (Steps 1-4)										
3. Removes carburetor and fuel tank (Steps 5-10)										
4. Disassembles automatic choke (Steps 11-12)										
5. Separates carburetor from fuel tank; removes spring, cap, and diaphragm (Steps 13-18)										

CHART FOR CAN YOU REPLACE THE CARBURETOR DIAPHRAGM?	DAYS									
	1	2	3	4	5	6	7	8	9	10
6. Checks "O" ring gasket (Step 19)										
7. Cleans carburetor and fuel tank (Steps 20-22)										
8. Checks fuel tank for warpage (Steps 23-24)										
9. Assembles new diaphragm and replaces it and spring on fuel tank (Steps 25-27)										
10. Places carburetor on diaphragm and fuel tank; replaces bolts (Steps 28-31)										

CHART FOR CAN YOU REPLACE THE CARBURETOR DIAPHRAGM?	DAYS									
	1	2	3	4	5	6	7	8	9	10
11. Reassembles automatic choke (Steps 32-37)										
12. Reassembles governor link, carburetor, and governor spring (Steps 38-42)										
13. Replaces breather hose, throttle cable, air cleaner, spark plug wire (Steps 43-46)										
14. Fills fuel tank, cranks and warms up engine, and adjusts carburetor (Steps 47-49)										
15. Replaces tools and cleans up work area (Step 50)										